Vancouver Island Generation Project and Georgia Strait Crossing Project

April 23, 2003

BC hydro

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VIGP - The Forecast Need

- Expected retirement of the HVDC system
- Reliable capacity for Vancouver Island Supply
- Recognized need since mid 1990s
- On Island gas generation first proposed in response to 1994 Request For Proposal
- 2000 update to the 1995 Integrated Electricity Plan shows Port Alberni Cogeneration as committed new generation resource
  - PAC in service date November 2003
- VIGP replaced PAC/Port Alberni Generation Project in late 2001; July 2006 in service date.

VIGP - The Planned Response

- VIGP comprises:
  - A 265 MW natural gas fired combined cycle power plant
  - A peak power output of 295 MW with duct firing
  - At Duke Point - property from Pope & Talbot
  - Natural gas service from Centra's Harmac pipeline.
  - Water supply from the existing Harmac water reservoir
  - Wastewater to Harmac treatment system
  - Upgrade 9 kms of transmission line to Duke Point

Nanaimo City Centre
Nanaimo River Estuary
Doman
Forest Products
Duke Point
Ferry Terminal
Nanaimo Port Authority
- Duke Point
Snuneymuxw
Reserves
Hwy 19
Hooker Road
Harmac
Waste water
Treatment
Canadianoxy
Chemicals
VIGP
Harmac
Substation
Phoenix
600060 BC Ltd
Harmac Pulp Operations
Water Pipelines

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Harmac Pulp Operations
Phoenix Way
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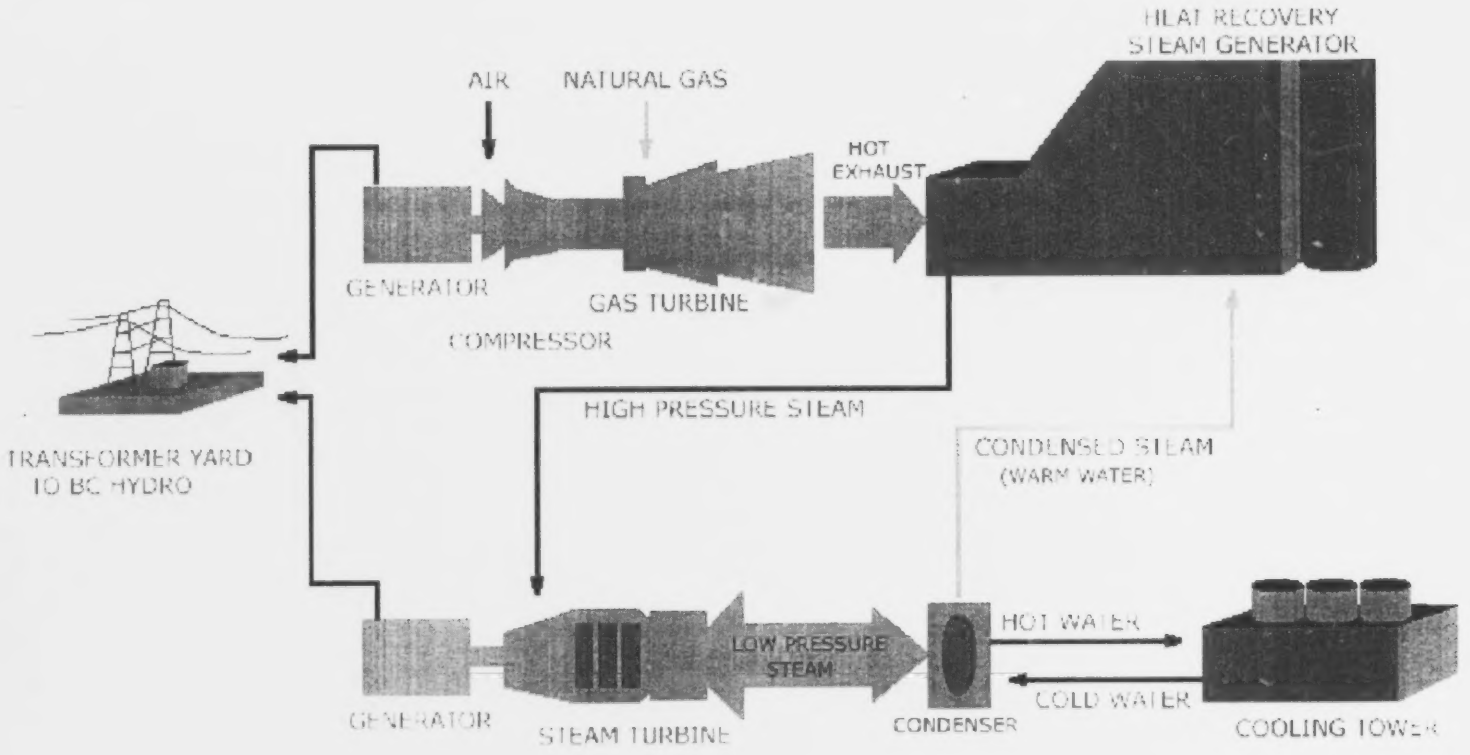
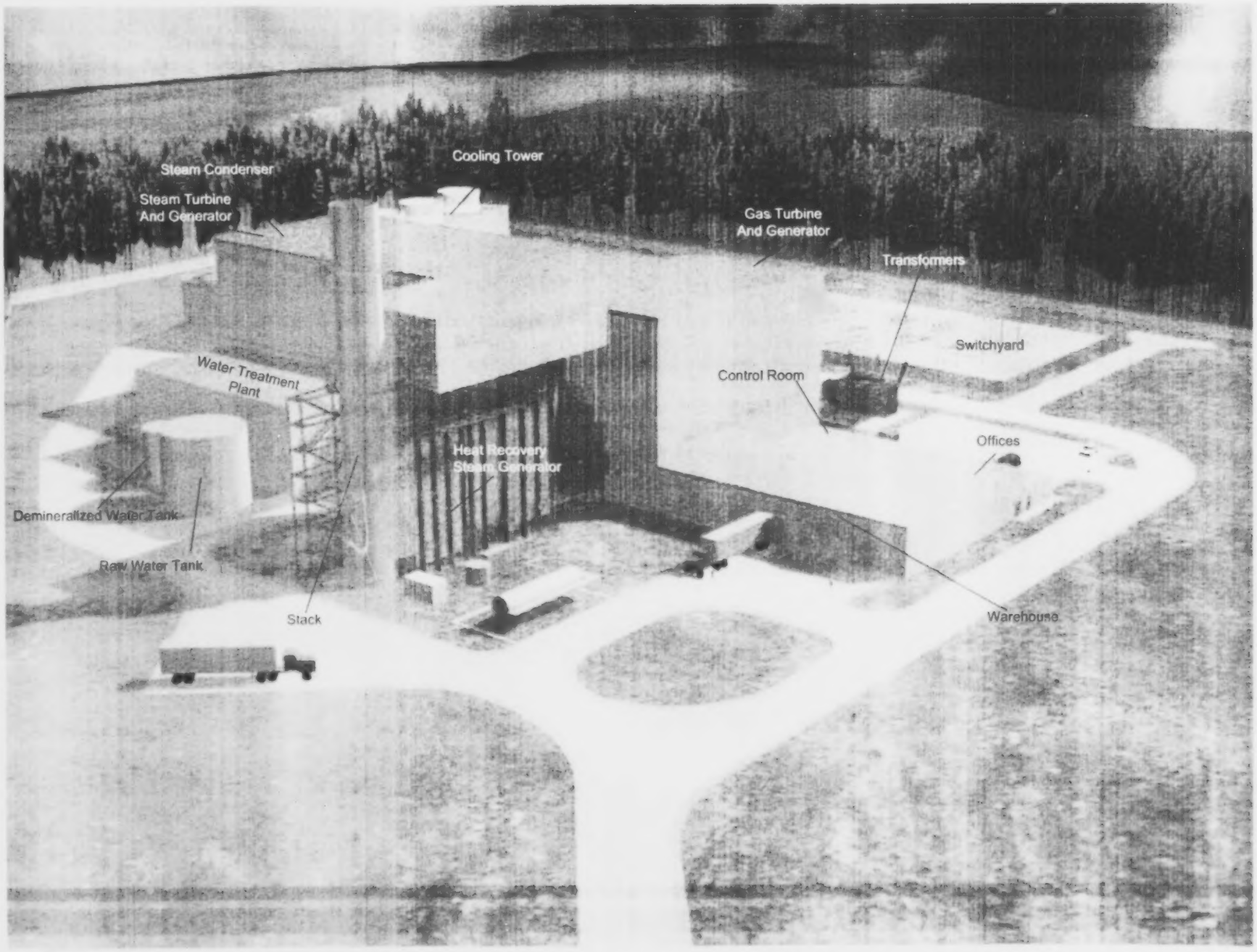
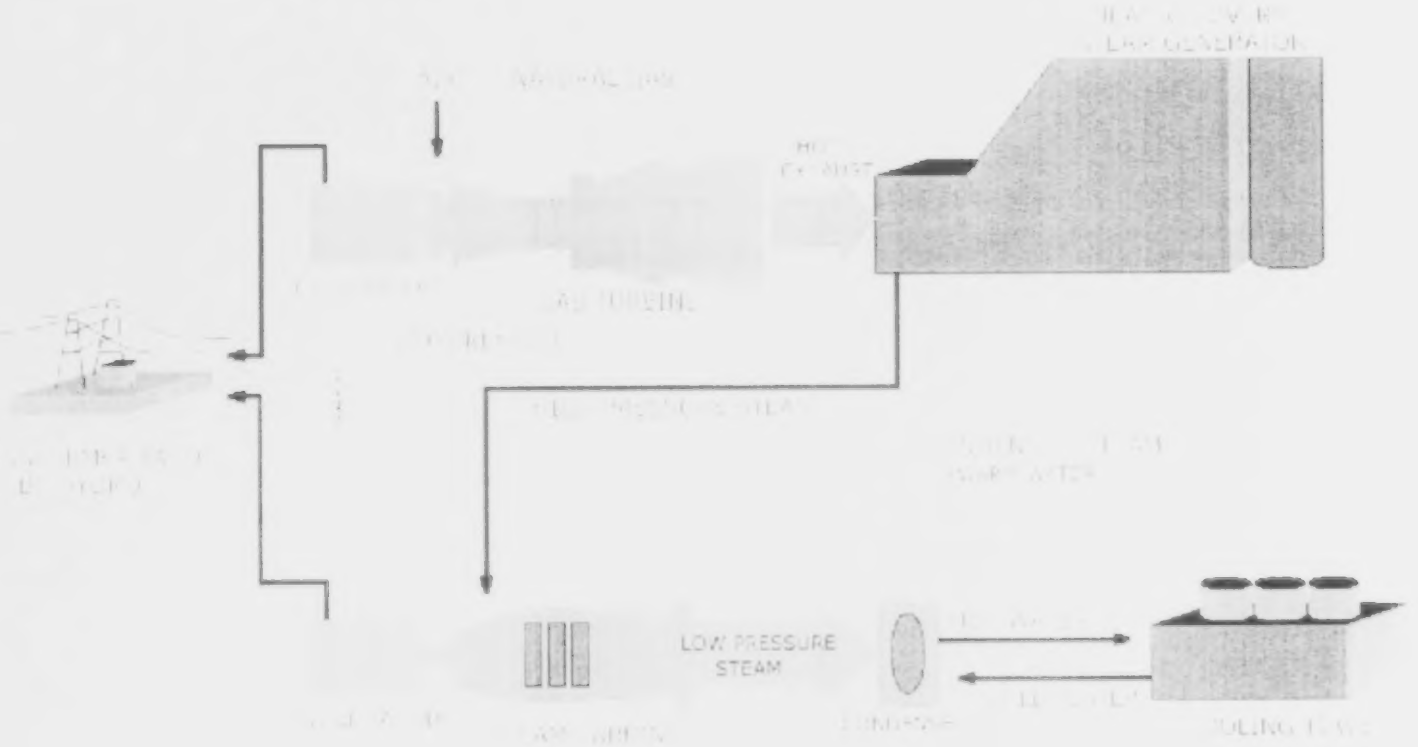
VIGP - Major Plant Equipment

- GE 7FA natural gas fired combustion turbine generator (CTG)
- Heat recovery steam generator (HRSG) with duct burners
- Selective catalytic reduction (SCR) for emission control
- Fuji Electric steam turbine generator (STG)
- Wet cooling tower to vent exhaust heat to the atmosphere
- Electrical switch yard


HEAT RECOVERY
STEAM GENERATOR
AIR
NATURAL GAS
HOT
EXHAUST
GENERATOR
GAS TURBINE
COMPRESSOR
HIGH PRESSURE STEAM
CONDENSED STEAM
(WARM WATER)
TRANSFORMER YARD
TO BC HYDRO
LOW PRESSURE
STEAM
HOT WATER
COLD WATER
GENERATOR
STEAM TURBINE
CONDENSER
COOLING TOWER


Steam Condenser
Steam Turbine
And Generator
Cooling Tower
Gas Turbine
And Generator
Transformers
Switchyard
Water Treatment
Plant
Control Room
Offices
Heat Recovery
Steam Generator
Demineralized Water Tank
Raw Water Tank
Stack
Warehouse


LOW PRESSURE
STEAM

Gas Turbine
Water Treatment Plant
Control Room
Switchyard
Offices
Demineralized Water Tank
Raw Water Tank
Warehouse

VIGP - The Plant Output

Nominal plant output will be:	
Without Duct Firing:	
Combustion Turbine:	170 MW
Steam Turbine:	95 MW
Rated Total Power Output:	265 MW
With Duct Firing:	
Combustion Turbine:	170 MW
Steam Turbine:	125 MW
Rated Total Power Output:	295 MW
Supply Voltage to BC Hydro	138kV
Primary Fuel:	Natural Gas
Backup Fuel:	None

VIGP - The Plant Output

- Plant
  - Dispatchable
  - Low number of starts per year
  - Output 2100 GWh

VIGP - The Plant Output

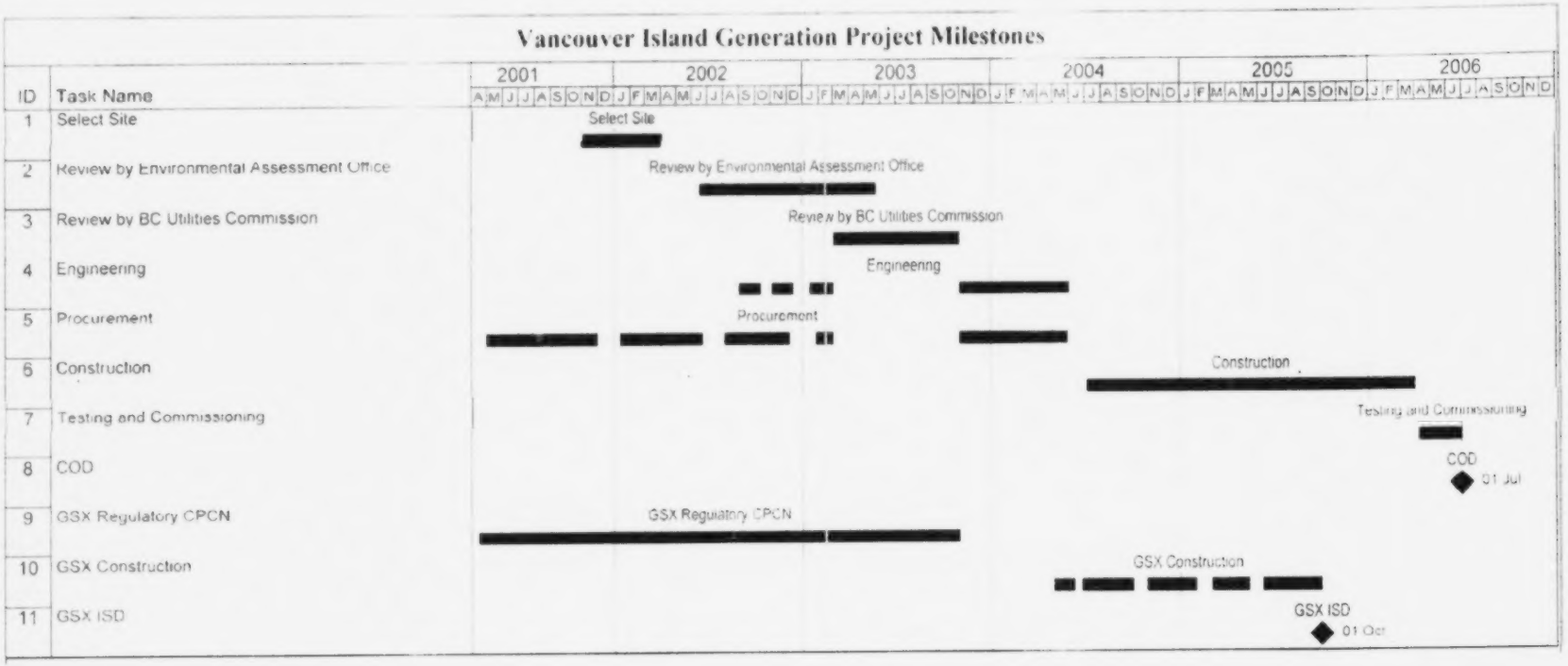
Plant Output	265 MW			295 MW		
Plant Condition	Heat Rate[a] GJ/GWh		Efficiency % LHV	Heat Rate[b] GJ/GWh		Efficiency % LHV
	HHV	LHV		HHV	LHV	
Clean and New	7135	6420	56.1	7275	6548	54.8
With Degradation	7308	6577	54.8	7451	6706	53.7

Notes:
HHV – On basis of gas higher heating value.
LHV – On basis of gas lower heating value.
a Average operation at an ambient temperature of 11.1 degrees C.
b Peak load operation during winter with duct firing at an ambient temperature of –3.3 degrees C.

VIGP EAO and BCUC Review

- VIGP EAO Review
  - Submitted June 2002, decision expected June 2003
- VIGP BCUC Review
  - Submitted March 2003

VIGP - Scheduled In Service



VIGP - Sunk Costs

- Coordinated GSX/VIGP in service dates optimizes costs.
- Early investment decisions needed for 2003 in service:
  - Long lead time for equipment
  - Different regulatory and construction timelines for GSX and VIGP.
- Late 2000 commitment for turbines enabled 2003 in service

VIGP - Sunk Costs

	($ millions)	
Forecast Spending:		
Turbines	87.0	
Other[1]	17.5	104.5
Salvage:		
Turbines	41.2	
Other	1.5	42.7
Net Sunk Cost[2]		61.8

[1] Includes overhead and interest during construction (IDC)
[2] More detail in Response to IR 2.1

VIGP - Costs

- Estimated Capital Cost — $340 million
- Planning in service date — July 2006
- Operating and Maintenance — $17.8 million/yr.
  - Excludes natural gas

VIGP - Costs

- Impacts on Capital Costs
  - Changed location
  - In service 2003 to 2006
  - Market conditions
  - Labour
  - Exchange rate US/Cdn $
  - Rate for overhead and interest during construction

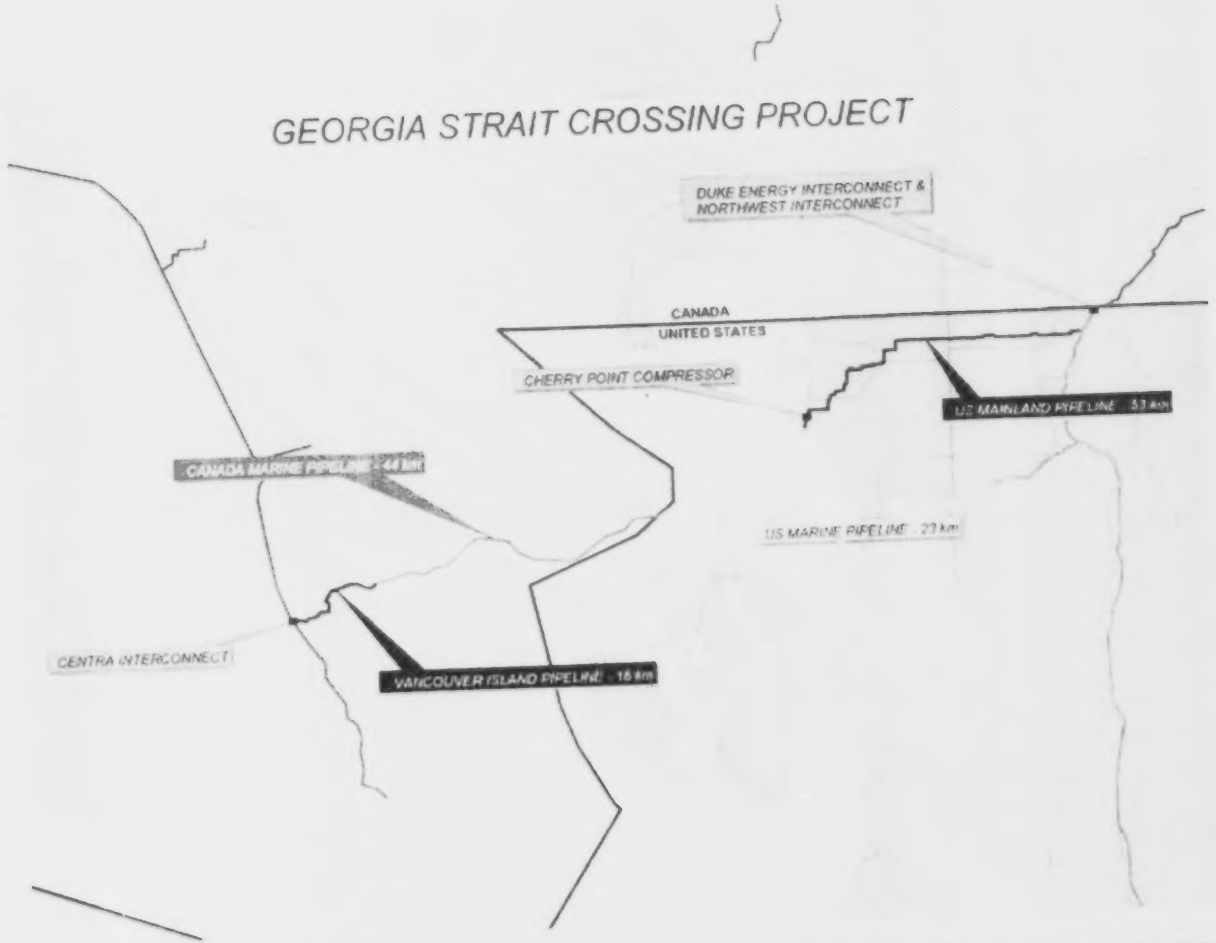
VIGP Status

- Steam Turbine Purchased
  - In Storage
- Gas Turbine Committed
  - In Manufacture
- Project Site Purchased
- Agreement for Water and Wastewater services in place
- Preliminary Engineering Complete
  - Design Basis Memorandum
  - HRSG Specification
- Interconnection Application made

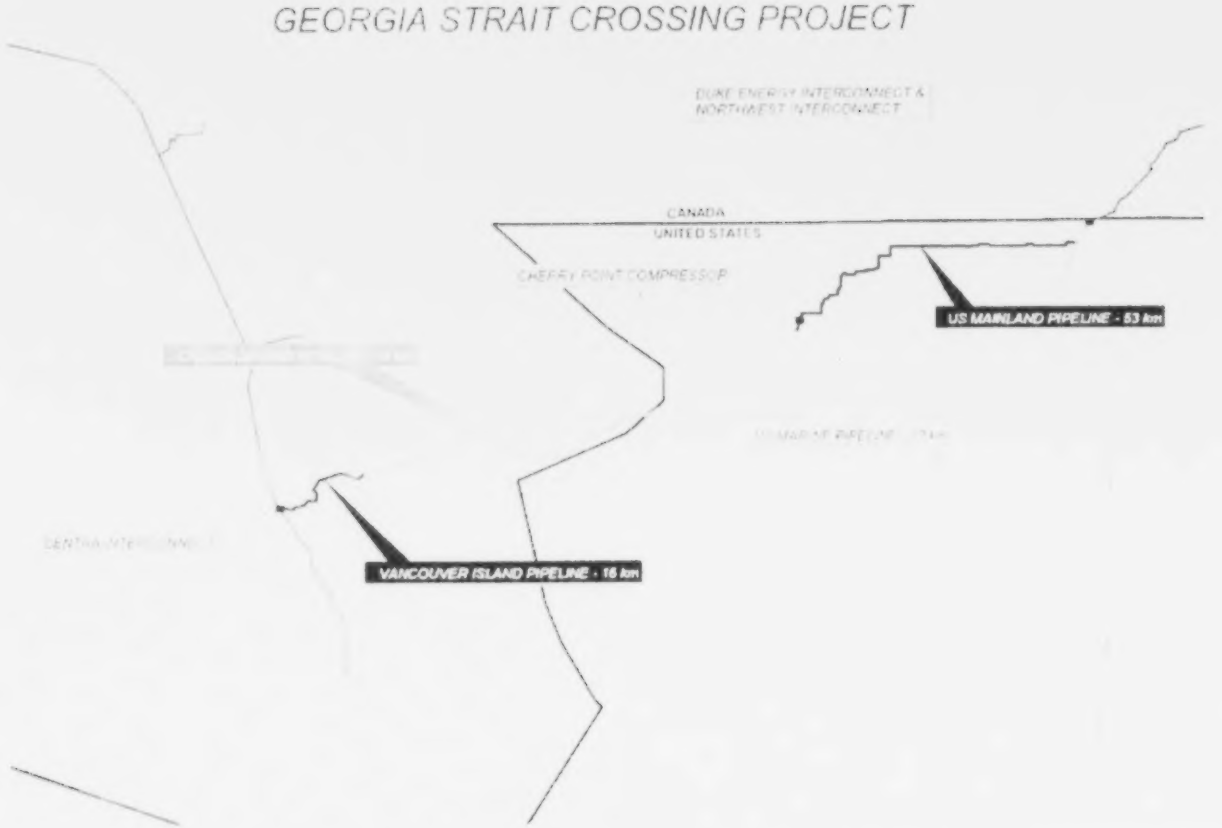
What is the GSX Project?

- A second natural gas pipeline connection between the mainland and Vancouver Island
- Co-sponsored by BC Hydro and Williams Gas Pipeline Co.
- Links Northwest/Duke Energy (Westcoast) pipeline systems and Centra Gas Vancouver Island pipeline system
- 20"diameter on US mainland, then 16" diameter to the Island
- Capacity 101 TJ/day @ 1800 psi delivery pressure
- Target capital cost US$209.5 million (C$322 million @ 0.65)

GSX Project Facilities



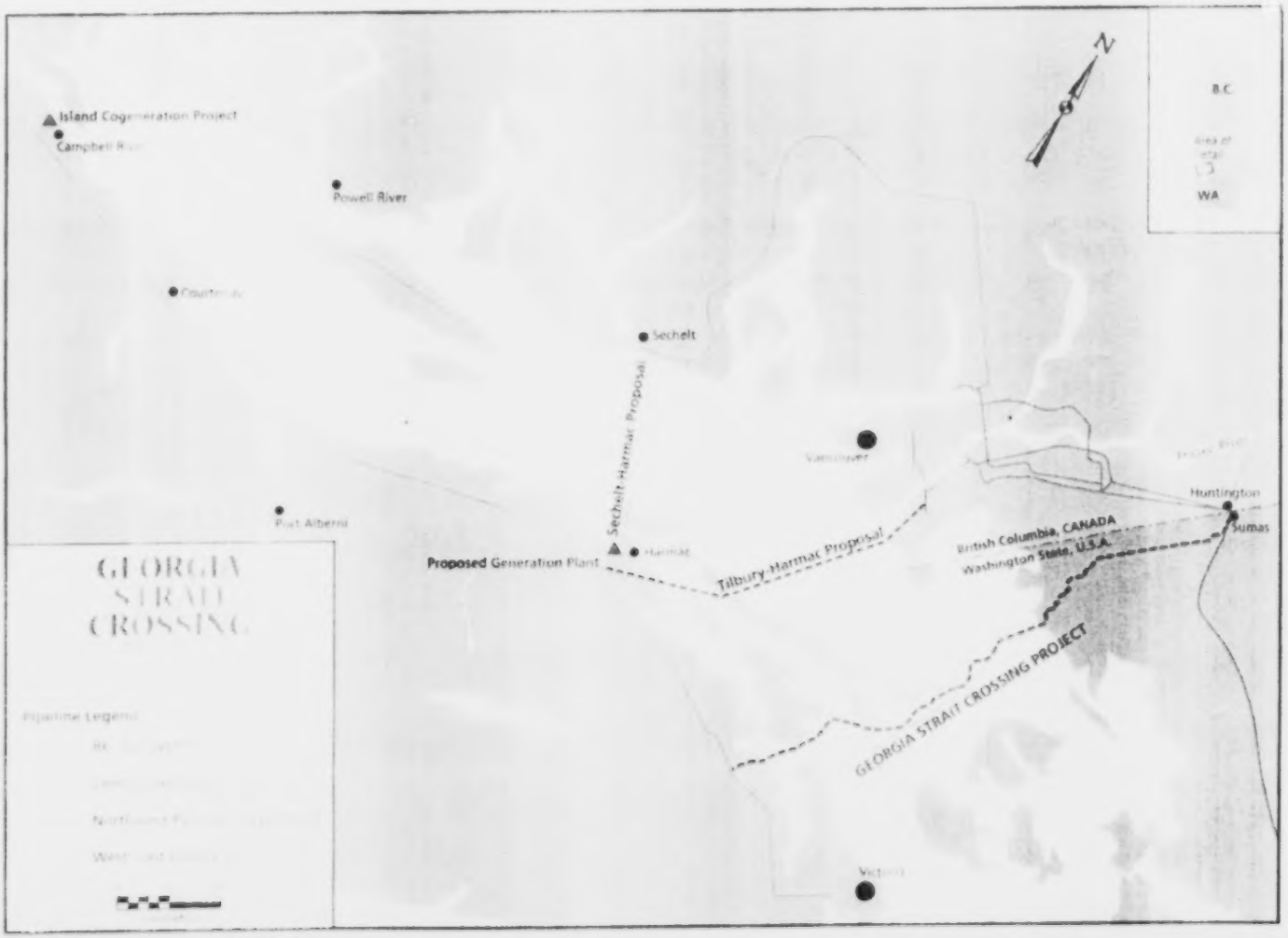
GSX Project Facilities



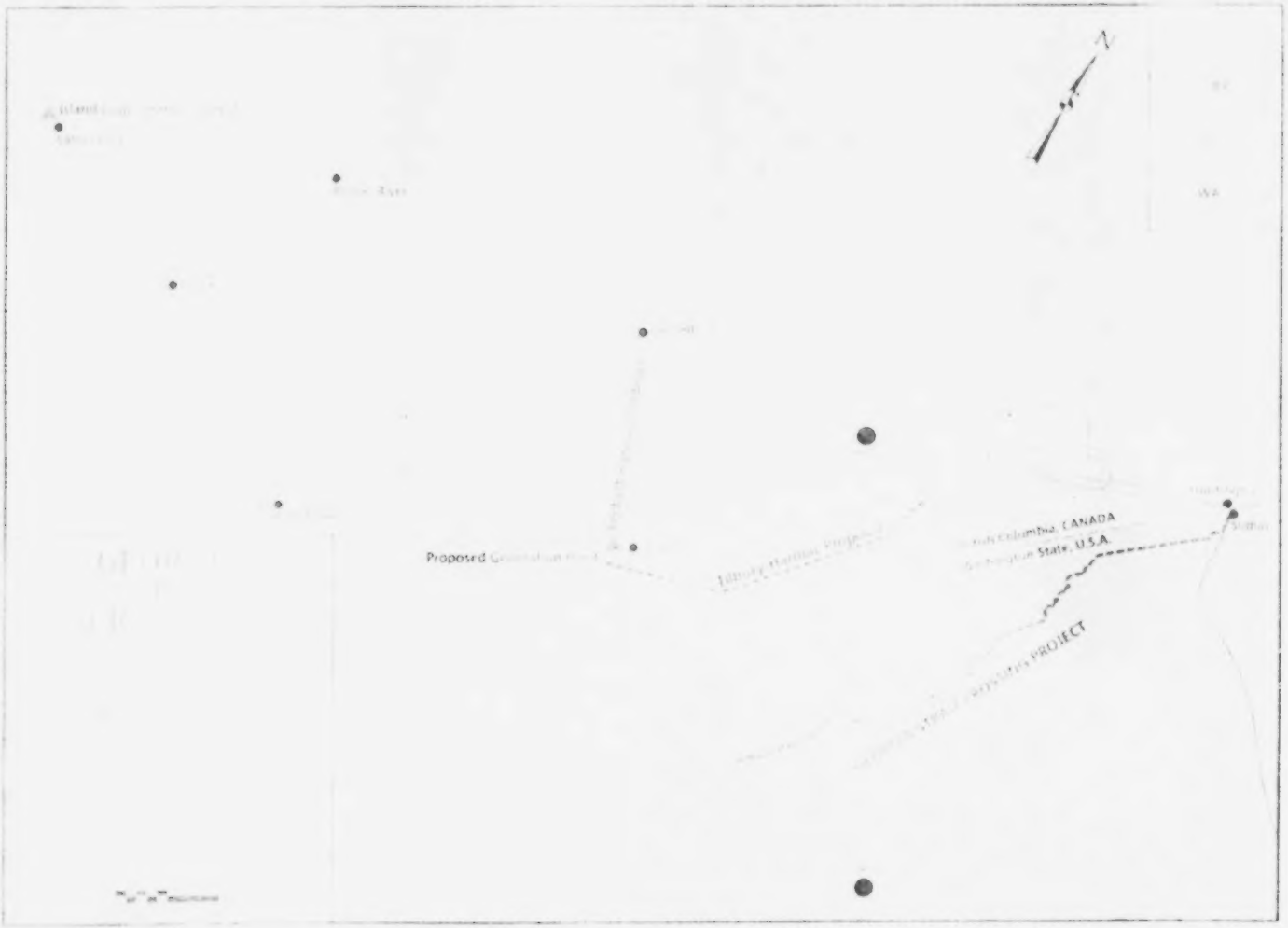
RFP for Gas Supply in 1998

- BC Hydro issued invitations for gas supply proposals in April 1998
- Responses for Island supply received from 3 companies
  - Williams - "GSX" proposal
  - BC Gas - "Tilbury-Harmac" proposal
  - Centra - "Sechelt-Harmac" proposal
- Williams proposal the most attractive based on technical feasibility, cost and lowest negative environmental impacts

GSX Pipeline Alternatives



GSX Pipeline Alternatives



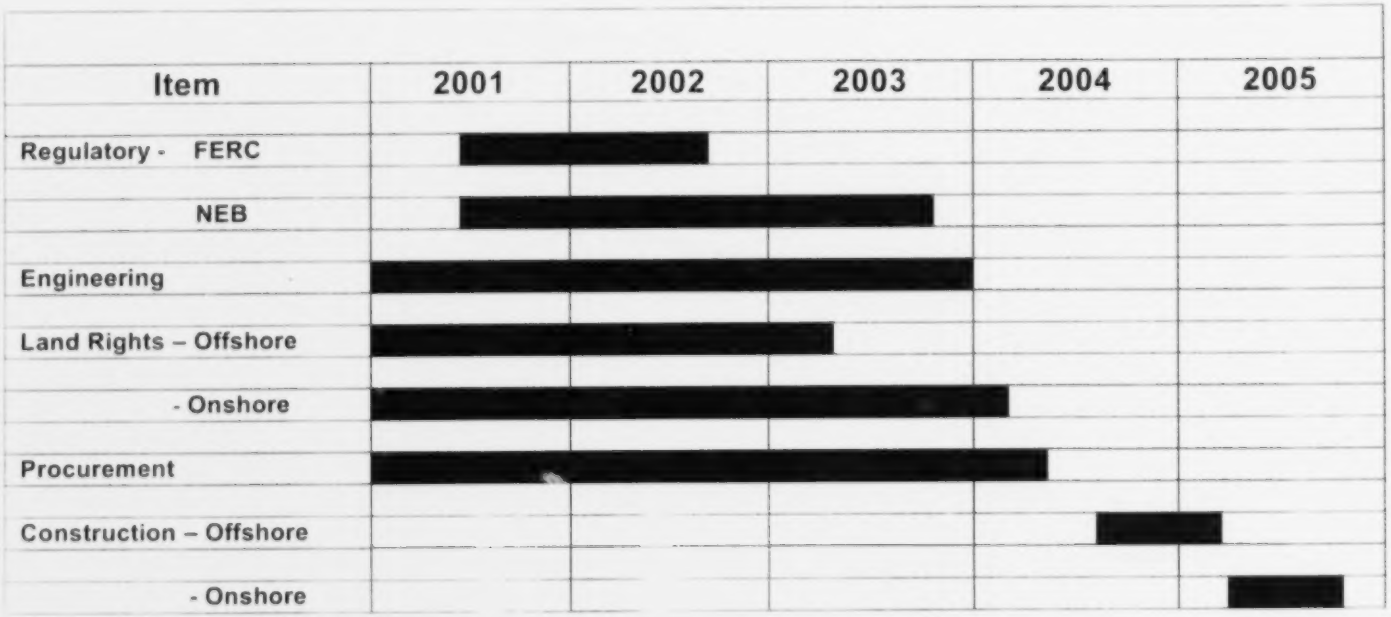
GSX Costs

- The current budget estimate for GSX is US$ 209.5 million
  - US$119.0 million in US; US$90.5 million in Canada
- The in-service date has been delayed from Oct. 2003 to Oct. 2005
- BC Hydro's current estimated cost is CAN$ 322 million.
- Costs to date CAN$46 million

GSX NEB/CEAA Review

- Mar 2000 - Preliminary submission filed with National Energy Board (NEB)
- Oct 2000 - federal Minister of Environment referred environmental assessment to a joint NEB/Canadian Environmental Assessment Agency (CEAA) panel
- Apr 2001 - Application filed with NEB
- Sep 2001 - Joint Review Panel (JRP) and review terms of reference announced
- Feb/Mar 2003 - oral hearing in Sidney
- Jun 2003 - JRP recommendation expected
- Oct 2003 - NEB decision expected

GSX Schedule



GSX Status

- Major project agreements executed (over 40)
  - key principles, ownership, transportation, financing
- Engineering - more than 80% complete
- Quotes received for line pipe, compressor, marine installation, shore approaches
- Land acquisition well underway
  - in US, 116 agreements needed; 70 signed up
  - in Canada, 23 agreements needed; 4 signed, another 12 (VIPLA) agreed to terms
- Benefits agreements with First Nations executed